

AMENDMENTS TO THE CLAIMS

1. (currently amended) An optical signal processor device (14) for use with means (10) for optically transmitting an information-carrying signal (~~S₁, S₄, S₂, S₃~~) and a back-propagated pump signal for amplifying said information-carrying signal, said device comprising means (20, 22) for suppressing backscattered signals (~~RS₁, RS₄, RS₂, RS₃~~) in the optical transmission means (10) and comprising being characterized in that it comprises:

an optical propagation medium (16) arranged for being connected in parallel with the optical transmission means (10),

divertor means (~~18, 20~~) being arranged for connecting, in parallel, at two connection points, the optical propagation medium to the optical transmission means and being arranged for diverting to this optical propagation medium, any said pump signal and a Rayleigh backscattering signal propagating in the opposite direction of the information-carrying signal in the optical transmission means,

at least a portion of the means for optically transmitting an information-carrying signal extending between the two divertor means, and

wavelength discrimination means for discriminating between a said pump signal intended to be back-propagated in the optical transmission means and a said Rayleigh backscattering signal, ~~these signals being diverted by the divertor means to the optical propagation medium~~, said discrimination means being connected to the optical propagation medium, between the two connection points, to suppress the Rayleigh backscattering signal by allowing only the pump signal to pass.

2. (currently amended) An optical signal processor device (14) according to claim 1, characterized in that the divertor means comprise two circulators (18, 20), each disposed at one of the points of connection of the optical propagation medium (16) to the optical transmission means (10), to cause the information-carrying signal to travel in the optical transmission means (10), and to cause the back-propagated signals to travel in the optical propagation medium (16) between the two circulators.

3. (currently amended) An optical signal processor device (14) according to claim 1, characterized in that it further comprises an optical functional module (24) disposed on the optical transmission means (10) between the two circulators (18, 20).

4. (currently amended) An optical signal processor device (14) according to claim 3, characterized in that the optical functional module (24) comprises an optical add/drop multiplexer for adding and dropping wavelengths and/or an optical switch and/or a polarization mode dispersion compensator and/or an optical regenerator.

5. (currently amended) An optical signal processor device (14) according to any one of claims 1 to 4, characterized in that the signal discrimination means (22) comprise a band-pass filter centered on the wavelength of the Raman pump signal (P) intended to be propagated in the optical transmission means (10).

6. (currently amended) An optical signal processor device (14) according to claim 4, characterized in that the signal discrimination means (22) comprise a Bragg grating fiber

whose reflection wavelength corresponds to the wavelength of the Rayleigh backscattering signal derived from the information-carrying signal.

7. (currently amended) An optical signal processor device (14) according to claim 6, for use with means (10) for optically transmitting a plurality of information-carrying signals (S_1, S_2, S_3), which device is characterized in that the signal discrimination means comprise a plurality of Bragg gratings (~~22a, 22b, 22c~~) disposed in series with reflection wavelengths corresponding to respective wavelengths carrying backscattered signals (~~RS₁, RS₂, RS₃~~) derived from the plurality of information-carrying signals.

8. (currently amended) An optical signal processor device (14) according to claim 6, for use with means (10) for optically transmitting a plurality of information-carrying signals (S_1, S_2, S_3) and characterized in that the signal discrimination means comprise an optical signal demultiplexer (26a) adapted to transmit only certain signals of predetermined wavelengths and associated with an optical signal multiplexer (~~26b~~).

9. (currently amended) An optical signal processor device (14) according to claim 8, characterized in that the optical transmission means (10) include a line optical fiber and the optical propagation medium (16) comprises an optical fiber portion.

10. (currently amended) An optical signal transmission installation comprising a distributed Raman amplification system, characterized in that it further comprises an optical signal processor device (14) according to claim 9.

_____ means for suppressing backscattered signals in the optical transmission means ~~and being characterized in that it comprises:-~~

an optical propagation medium arranged for being connected in parallel with the optical transmission means,

divertor means being arranged for connecting, in parallel, at two connection points, the optical propagation medium to the optical transmission means and being arranged for diverting to said optical propagation medium ~~the~~ said back-propagated signals in the optical transmission means,

at least a portion of the means for optically transmitting an information-carrying signal extending between the two divertor means, and

discrimination means for discriminating between ~~a~~ said pump signal ~~intended to be backpropagated in the optical propagation means~~ and a Rayleigh backscattering signal, said discrimination means being connected to the optical propagation medium to suppress by filtering ~~the~~ Rayleigh backscattering signal and to allow only ~~the~~ said pump signal to pass, the signal discrimination means comprising a Bragg grating fiber whose reflection wavelength corresponds to the wavelength of ~~the~~ said Rayleigh backscattering signal derived from the information-carrying signal.

14. (currently amended) An optical signal processor device arranged for being fitted to means for optically transmitting an information-carrying signal and a back-propagated pump signal for amplifying said information-carrying signal, said device comprising:

means for suppressing backscattered signals in the optical transmission means, ~~and being characterized in that it comprises:-~~

_____ means for suppressing backscattered signals in the optical transmission means;
~~and being characterized in that it comprises:~~

an optical propagation medium arranged for being connected in parallel with the optical transmission means,

divertor means being arranged for connecting, in parallel, at two connection points, the optical propagation medium to the optical transmission means, the divertor means comprising two circulators, each disposed at one of the connection points, to cause the information-carrying signal to travel in the optical transmission means, and to cause any back propagated signal to travel in the optical propagation medium between the two circulators,

at least a portion of the means for optically transmitting an information-carrying signal extending between the two circulators, and

wavelength discrimination means for discriminating between asaid pump signal ~~intended to be back-propagated in the optical transmission means~~ and a Rayleigh backscattering signal, these signals being diverted by the divertor means to the optical propagation medium, said discrimination means being connected to the optical propagation medium, between the two connection points, to suppress the Rayleigh backscattering signal by allowing only the pump signal to pass.

13. (currently amended) An optical signal processor device arranged for being fitted to means for optically transmitting an information-carrying signal and a back-propagated pump signal for amplifying said information-carrying signal, said device comprising:

11. (currently amended) An optical signal processor device (14) for use with means (10) for optically transmitting a plurality of information-carrying signals propagating in optical transmission means (10) at different wavelengths (~~S1, S2, S3~~) and a plurality of back-propagated pump signals for amplifying said information-carrying signal, said device comprising :

means (~~20, 22~~) for suppressing backscattered signals (~~RS1, RS2, RS3~~) in the optical transmission means (10),

an optical propagation medium (16), and

divertor means (~~18, 20~~) arranged for connecting, in parallel, at two connection points, the optical propagation medium (16) to the optical transmission means (10), and suitable for diverting, to said optical propagation medium (16), the back-propagated signals (~~P1, P2, P3; RS1, RS2, RS3~~) in the optical transmission means (10), in which the backscattered signal suppression means are means (22) for discriminating between a plurality of pump signals (~~P1, P2, P3~~) intended to be back-propagated in the optical transmission means (10) and Rayleigh backscattering signals (~~RS1, RS2, RS3~~), said discrimination means (22) being connected to the optical propagation medium (16) to suppress the Rayleigh backscattering signals (~~RS1, RS2, RS3~~) by filtering that passes the pump signals (~~P1, P2, P3~~) only.

12. (currently amended) An optical signal processor device arranged for being fitted to means for optically transmitting an information-carrying signal and a back-propagated pump signal for amplifying said information-carrying signal, said device comprising

an optical propagation medium arranged for being connected in parallel with the optical transmission means,

divertor means being arranged for connecting, in parallel, at two connection points, the optical propagation medium to the optical transmission means and being arranged for diverting to said optical propagation medium ~~the~~ said back-propagated pump signals in the optical transmission means,

at least a portion of the means for optically transmitting an information-carrying signal extending between the two divertor means, and

discrimination means for discriminating between a said pump signal ~~intended to be backpropagated in the optical propagation means~~ and a Rayleigh backscattering signal, said discrimination means being connected to the optical propagation medium to suppress by filtering the Rayleigh backscattering signal and to allow only ~~the~~ said pump signal to pass, the signal discrimination means comprising a band-pass signal centered on the wavelength of the Raman pump signal intended to be propagated in the optical transmission means.

15. (new) An optical signal processor device according to claim 1, wherein said means for optically transmitting the information-carrying signal are adapted to transmit a plurality of information-carrying signals propagating at different wavelength and wherein said discrimination means are adapted to suppress a plurality of Rayleigh backscattering signals each associated with a corresponding information-carrying signal while allowing a plurality of pump signals to pass, each pump signal being associated with a corresponding information-carrying signal.